CMT107
IDE Controller and Hard Drive Carrier with Floppy utilityModule

User's Manual

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Rev. A

ISO9001 and AS9100 Certified

CMT107 ISOLATED
IDE Controller and Hard Drive Carrier with Floppy utilityModule
User's Manual

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Chapter 1 INTRODUCTION

This manual gives information on the CMT107 IDE Controller and Hard Disk Carrier with Floppy utilityModule. This module allows you to stack a 2.5 inch hard drive in your PC/104 system and provides connectors for a slave drive and a floppy.

CMT107 IDE and Hard Drive Carrier with Floppy utilityModule

The CMT107 utilityModule was designed to provide an IDE hard drive and floppy controller in the PC/104 stack to support the Real Time Devices family of cpuModules and other standard PC/104 processor modules.

Features

The following are major features of the CMT107 utilityModule.

IDE Controller and Drive

- Bus mode -- decodes IDE interface through the PC/104 bus for cableless operation
- IDE mode -- allows use with an IDE cable for use with another IDE controller or as a slave drive to another CMT107
- Jumper selection of primary or secondary IDE interface in bus mode
- Primary -- IDE Interface at 1F0-1F7h, 3F6-3F7h, Interrupt 14
- Secondary -- IDE Interface at 170-177h, 376-377h, Interrupt 15
- Floppy Controller
- Supports two 360 KB, 1.2MB, 720KB or 1.44MB drives

Connectors

Connectors provided are:

- CN1: PC/104 Bus (XT)
- CN2: PC/104 Bus (AT)
- CN3: 2.5" IDE hard drive
- CN4: Reserved
- CN5: Floppy drive
- CN6: IDE cable connector
- CN7: Configuration jumpers

General Specifications

- Dimensions: 3.8 x 3.9 x 0.6" (97 x 100 x 16 mm)
- Weight (mass): 3.0 ounces (85 grams)
- 4-layer PCB
- Operating conditions: (not including drive)
- temperature: 0 - 70 degrees C
- relative humidity: 0 - 95%, non-condensing
- Storage temperature: -55 to +85 degrees C

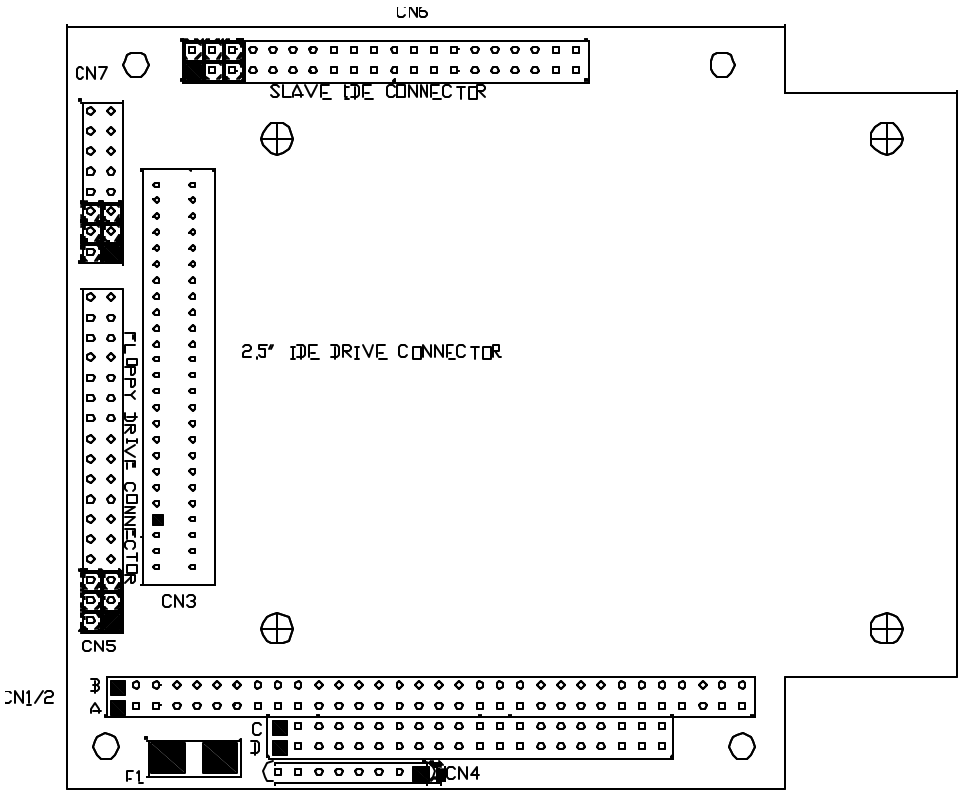
Chapter 2 CONFIGURING THE UTILITYMODULE

The following sections contain information on configuring the utilityModule.

Jumpers CN7

Locations

The figure below shows connector and jumper locations.



CN7 configures the following functions:

- 1-2 -- Floppy enable
- 3-4 -- Floppy disable
- 5-6 -- IDE bus decode enable, CN6 can be used for second drive on this interface
- 7-8 -- IDE bus decode disable, CN6 can be used to cable from an IDE controller
- 9-10 -- IDE Primary
- 11-12 -- IDE Secondary
- 13-14 -- from on-board drive pins 47-48 (function determined by drive)
- 15-16 -- from on-board drive pins 49-50 (function determined by drive)

Default Settings

The utilityModule is delivered from the factory configured as the Primary IDE interface and with the floppy enabled.

- 1-2 -- Shorted
- 3-4 -- Open
- 5-6 -- Shorted
- 7-8 -- Open
- 9-10 -- Shorted
- 11-12 -- Open
- 13-14 -- Open
- 15-16 -- Open

Chapter 3 INSTALLING THE UTILITYMODULE

Since the utilityModule uses a PC/104 stackthrough bus, the only hardware installation you will do is placing the module to the PC/104 stack. To do this, you will connect the PC/104 bus connector with the matching connector of another module.

Recommended Procedure

We recommend you follow the procedure below to ensure that stacking of the modules does not damage connectors or electronics.

- Turn off power to the PC/104 system or stack.
- Select and install standoffs to properly position the utilityModule on the PC/104 stack.
- Touch a grounded metal part of the stack to discharge any buildup of static electricity.
- Remove the utilityModule from its anti-static bag.
- Check that keying pins in the PC/104 bus connector are properly positioned.
- Check the stacking order: make sure an XT bus card will not be placed between two AT bus cards, or it will interrupt the AT bus signals.
- Hold the utilityModule by its edges and orient it so the bus connector pins line up with the matching connector on the stack.
- Gently and evenly press the utilityModule onto the PC/104 stack.

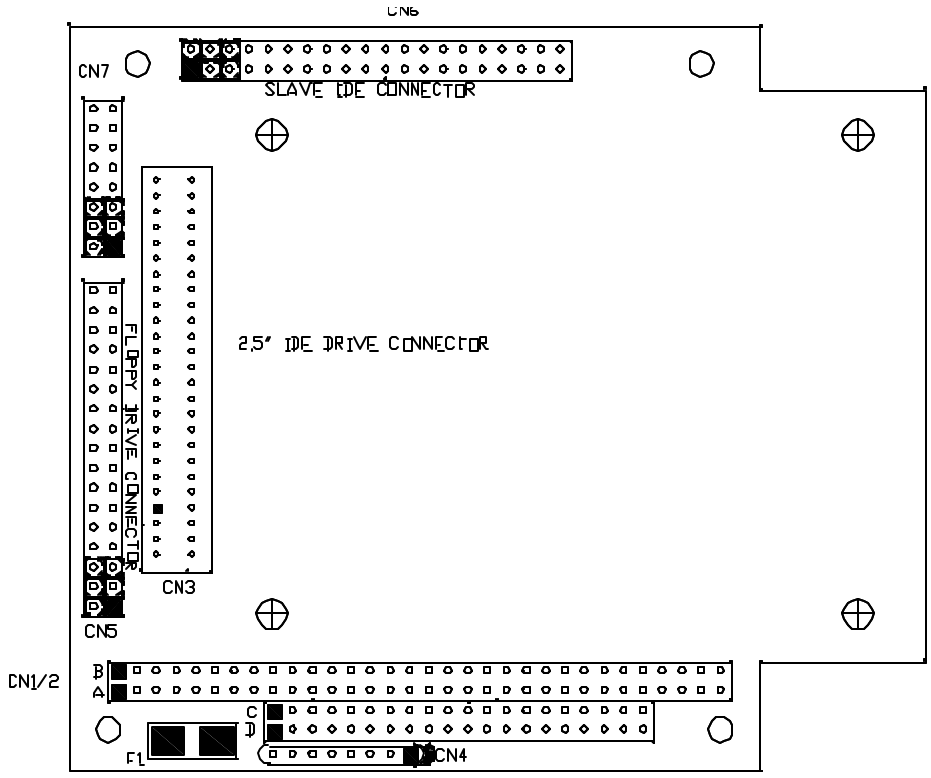
CAUTION: Do not force the module onto the stack! Wiggling the module or applying too much force may damage it. If the module does not readily press into place, remove it, check for bent pins or out-of-place keying pins, and try again.

Chapter 4 CONNECTING THE UTILITYMODULE

The following sections describe connectors of the utilityModule.

Locations

The figure below shows connector locations.



Connector Locations

Connectors		
Connector	**Function**	**Size**
CN1	PC/104 XT Bus	64 pin
CN2	PC/104 AT Bus	40 pin
CN3	2.5" IDE Drive	50 pin
CN4	Reserved	
CN5	Floppy	34 pins
CN6	IDE cable	40 pins
CN7	Jumpers	16 pins

Finding Pin 1 of Connectors

The pin 1 end of connectors is indicated by a white area silk-screened on the PC board. It is also indicated by a square solder pad visible on the bottom of the PC board.

Please make certain you have correctly identified pin 1 of a connector before you connect to it and attempt to use the utilityModule.

PC/104 Bus Connectors, CN1 and CN2

Connectors CN1 and CN2 provide PC/104 bus connections. CN1 carries XT bus signals, and CN2 carries additional signals for the AT bus. The signals on CN1 and CN2 conform to the IEEE P966 standard for the PC/104 bus.

The following tables list the connector pinouts:

PC/104 XT Bus Connector, CN1		
Pin	**Row A**	**Row B**
1	IOCHCHK*	0V
2	SD7	RESETDRV
3	SD6	+5V
4	SD5	IRQ9
5	SD4	-5V
6	SD3	DRQ2
7	SD2	-12V
8	SD1	ENDXFR*
9	SD0	+12V
10	IOCHRDY	(KEYING PIN)
11	AEN	SMEMW*
12	SA19	SMEMR*
13	SA18	IOW*
14	SA17	IOR*
15	SA16	DACK3
16	SA15	DRQ3
17	SA14	DACK1*
18	SA13	DRQ1
19	SA12	REFRESH
20	SA11	SYSCLK
21	SA10	IRQ7
22	SA9	IRQ6
23	SA8	IRQ5
24	SA7	IRQ4
25	SA6	IRQ3
26	SA5	DACK2*
27	SA4	TC
28	SA3	BALE
29	SA2	+5V
30	SA1	OSC
31	SA0	0V
32	0V	0V

PC/104 AT Bus Connector, CN2		
Pin	**Row C**	**Row D**
0	0V	0V
1	SBHE*	MEMCS16*
2	LA23	IOCS16*
3	LA22	IRQ10
4	LA21	IRQ11
5	LA20	IRQ12
6	LA19	IRQ15
7	LA18	IRQ14
8	LA17	DACK0*
9	MEMR*	DRQ0
10	MEMW*	DACK5*
11	SD8	DRQ5
12	SD9	DACK6*
13	SD10	DRQ6
14	SD11	DACK7*
15	SD12	DRQ7
16	SD13	+5V
17	SD14	MASTER*
18	SD15	0V
19	(KEYING PIN)	0V

Note: Two locations on the bus have mechanical keying pins to help prevent misconnection of the PC/104 bus. These keying pins are a part of the PC/104 standard, and we strongly recommend you leave them in place.

If you have other modules without keying pins, we suggest you modify them to include keying.

2.5" IDE Drive, CN3

CN3 is a 50-pin 2mm DIL connector used for connecting the hard drive. The pinout of this connector is shown below.

IDE Hard Drive Connector, CN3			
Pin	**Signal**	**Function**	**in/out**
1	RESET*	Reset HD	out
2	GND	Ground signal	--
3	HD7	HD data 7	in/out
4	HD8	HD data 8	in/out
5	HD6	HD data 6	in/out
6	HD9	HD data 9	in/out
7	HD5	HD data 5	in/out
8	HD10	HD data 10	in/out
9	HD4	HD data 4	in/out
10	HD11	HD data 11	in/out
11	HD3	HD data 3	in/out
12	HD12	HD data 12	in/out
13	HD2	HD data 2	in/out
14	HD13	HD data 13	in/out
15	HD1	HD data 1	in/out
16	HD14	HD data 14	in/out
17	HD0	HD data 0	in/out
18	HD15	HD data 15	in/out
19	GND	Ground signal	--
20	n.c.		--
21	AEN	Address Enable	out
22	GND	Ground signal	--
23	IOW*	I/O Write	out
24	GND	Ground signal	--
25	IOR*	I/O Read	out
26	GND	Ground signal	--
27	IOCHRDY	I/O Channel Ready	in
28	BALE	Bus Address Latch Enable	out
29	n.c.		
30	GND	Ground signal	--
31	IRQ	Interrupt Request	in
32	IOCS16*	16 bit transfer	in
33	A1	Address 1	out
34	GND	Ground signal	--
35	A0	Address 0	out
36	A2	Address 2	out
37	HCS0*	HD Select 0	out
38	HCS1*	HD Select 1	out
39	LED	HDD activity LED (-)	in

40	GND	Ground signal	--
41	+5VDC	Drive Power	--
42	+5VDC	Drive Power	--
43	Gnd	Drive Ground	--
44	N/C	Not Connected	--
45	N/C	Not Connected	--
46	N/C	Not Connected	--
47		To CN7 - 13	
48		To CN7 - 14	
49		To CN7 - 15	
50		To CN7 - 16	

Floppy Disk, CN5

CN5 is a 34-pin DIL connector which provides the standard signals to connect one or two floppy disk drives. The pinout of this connector is shown below.

Floppy Drive Connector, CN5			
Pin	**Signal**	**Function**	**In/out**
2	RWC*	write precompensation	out
4	n.c.		--
6	n.c.		--
8	INDEX*	index pulse	in
10	MOTEN1*	motor 1 enable	out
12	DRVSEL1*	drive select 1	out
14	DRVSEL2*	drive select 1	out
16	MOTEN2*	motor 2 enable	out
18	DIRECTION*	step direction	out
20	STEP*	step pulse	out
22	WRDATA*	write data	out
24	WREN*	write enable	out
26	TRACK0*	track 0 signal	in
28	WRPROT*	write protect	in
30	RDDATA*	read data	in
32	HEADSEL*	head select	out
34	DSKCHG*	disk change	in
ODD PINS	GND	Ground signal	--

IDE Cable , CN6

CN3 is a 40-pin 100 mil DIL connector used to connect a cable to a second drive if the CMY107 is in BUS mode and to connect to an IDE controller in IDE mode. The pinout of this connector is shown below.

IDE Hard Drive Connector, CN3			
Pin	**Signal**	**Function**	**in/out**
1	RESET*	Reset HD	out
2	GND	Ground signal	--
3	HD7	HD data 7	in/out
4	HD8	HD data 8	in/out
5	HD6	HD data 6	in/out
6	HD9	HD data 9	in/out
7	HD5	HD data 5	in/out
8	HD10	HD data 10	in/out
9	HD4	HD data 4	in/out
10	HD11	HD data 11	in/out
11	HD3	HD data 3	in/out
12	HD12	HD data 12	in/out
13	HD2	HD data 2	in/out
14	HD13	HD data 13	in/out
15	HD1	HD data 1	in/out
16	HD14	HD data 14	in/out
17	HD0	HD data 0	in/out
18	HD15	HD data 15	in/out
19	GND	Ground signal	--
20	n.c.		--
21	AEN	Address Enable	out
22	GND	Ground signal	--
23	IOW*	I/O Write	out
24	GND	Ground signal	--
25	IOR*	I/O Read	out
26	GND	Ground signal	--
27	IOCHRDY	I/O Channel Ready	in
28	BALE	Bus Address Latch Enable	out
29	n.c.		
30	GND	Ground signal	--
31	IRQ	Interrupt Request	in
32	IOCS16*	16 bit transfer	in
33	A1	Address 1	out
34	GND	Ground signal	--
35	A0	Address 0	out
36	A2	Address 2	out
37	HCS0*	HD Select 0	out
38	HCS1*	HD Select 1	out

39	LED	HDD activity LED (-)	in
40	GND	Ground signal	--

Chapter 5 USING THE UTILITYMODULE

IDE Hard Disk

The CMT107 provides an IDE interface to 2.5 inch, 3.2 Gbyte hard drive. This hard drive can be set up as the primary or the secondary drive (you must be sure that your CPU BIOS supports both primary and secondary drives).

Since the CMT107 provides the IDE decoding on-board, there is no need for any cabling. You must be sure to disable any other IDE controllers that might be present on your CPU module or VGA module.

You may need to run the setup program for your cpuModule or computer to configure the correct hard drive type.

Power Protection Circuitry

To reduce the risk of damage due to power-supply problems, the utilityModule includes several protective components.

Module Power-Supply Protection

The utilityModule includes components to help prevent damage due to problems with the +5 VDC power supply from the PC/104 bus or power-supply connector. Protection is provided for:

- Over-current
- Reversed polarity
- Excessive voltage

This protection is only for the utilityModule, and will not protect other devices in a PC/104 stack .

The protective fuse is replaceable and is available from electronics suppliers. Its description and part number are:

Littelfuse Nano^2 SMF 1.0 amp, R451-001

Caution:	Replace fuses only with parts of identical current and voltage rating.

Chapter 6 RETURN POLICY AND WARRANTY

Return Policy

If you wish to return a product to the factory for service, please follow this procedure:

Read the Limited Warranty to familiarize yourself with our warranty policy.

Contact the factory for a Return Merchandise Authorization (RMA) number.

Please have the following available:

- Complete board name
- Board serial number
- A detailed description of the board's behavior

List the name of a contact person, familiar with technical details of the problem or situation, **along with their phone and fax numbers, address, and e-mail address** (if available).

List your shipping address!!

Indicate the shipping method you would like used to return the product to you.
We will not ship by next-day service without your pre-approval.

Carefully package the product, using proper anti-static packaging.

Write the RMA number in large (1") letters on the outside of the package.

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